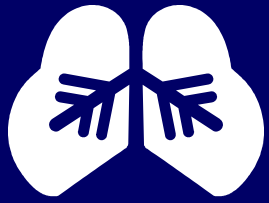


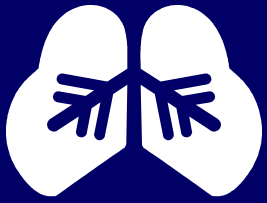
Component 2: Control of Factors Contributing to Asthma Severity

- Assess exposure and sensitivity to:
 - Inhalant allergens
 - Occupational exposures
 - Irritants:
 - Indoor air (including tobacco smoke)
 - Air pollution



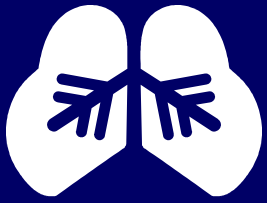
Component 2: Control of Factors Contributing to Asthma Severity (continued)

- Provide written and verbal instructions for reducing exposures/controlling precipitants (i.e., environmental control)



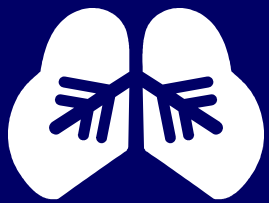
Component 2: Control of Factors Contributing to Asthma Severity (continued)

- **Assess contribution of other factors:**
 - Rhinitis/sinusitis
 - Gastroesophageal reflux
 - Drugs (NSAIDs, beta-blockers)
 - Viral respiratory infections
 - Sulfite sensitivity



Strong Association Between Asthma and Sensitization to Allergens

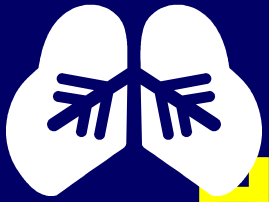
- Genetically susceptible populations who are sensitized to house-dust mite, animal dander, cockroach, and *Alternaria* are at risk for developing asthma.
- Sensitization to pollens carries less risk for asthma.



Strong Association Between Asthma and Sensitization to Allergens

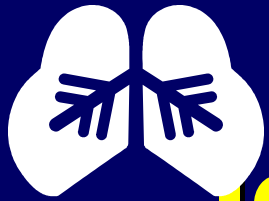
(continued)

- Importance of inhalant sensitivity declines with advancing age.
- Exposure to seasonal outdoor fungal spores and indoor allergens has been implicated in fatal asthma exacerbations.
- Allergen exposure must be considered in the treatment of asthma.



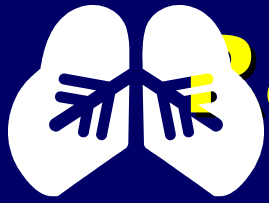
Results of Reducing House-Dust Mite Exposure

- In house-dust mite-sensitive patients, reduction of exposure has
 - Reduced:
 - Asthma symptoms
 - Evidence of airway inflammation
 - Nonspecific bronchial hyperresponsiveness
 - Improved:
 - Pulmonary function



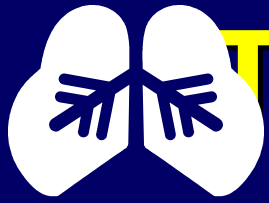
Approach to the Identification and Control of Inhalant Allergens

- Determine relevant exposures
- Assess sensitivity to:
 - Seasonal allergens by history
 - Perennial allergens by history, and when necessary, skin or in vitro testing
- Assess significance of positive tests in context of medical history



Rationale for Allergy Testing for Perennial Allergens

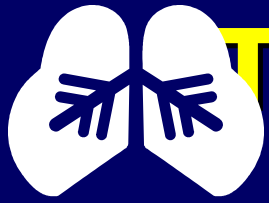
- About 80% of Americans are exposed to house-dust mites.
- About 60% of Americans are exposed to cats or dogs.
- Cockroaches are a major allergen in inner cities.
- Sensitivity usually cannot be determined by history alone.



Teach Patients To Reduce Exposure to Their Inhalant Allergens

Animal Dander

- Remove pet from house (ideal)
- Keep animal out of patient's bedroom (at a minimum)
- Seal or put a filter on air ducts that lead to bedroom

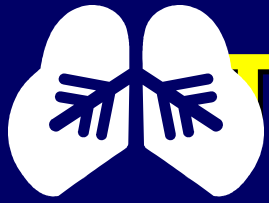


Teach Patients To Reduce Exposure to Their Inhalant Allergens (continued)

House-Dust Mites

■ Essential:

- Encase mattress in an allergen-impermeable cover
- Encase pillow in an allergen-impermeable cover or wash weekly
- Wash sheets and blankets in hot water weekly ($\geq 130^{\circ}\text{F}$ is necessary for killing mites)

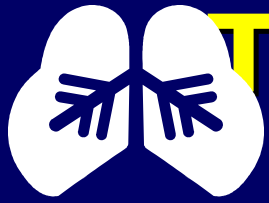


Teach Patients To Reduce Exposure to Their

Inhalant Allergens (continued) **House-Dust Mites**

■ Desirable:

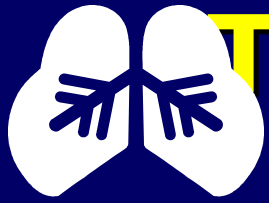
- Reduce indoor humidity to less than 50%
- Remove carpets from the bedroom
- Avoid sleeping or lying on upholstered furniture
- Remove carpets laid on concrete
- Routine use of chemicals to kill house-dust mites and to denature the antigen not recommended



Teach Patients To Reduce Exposure to Their Inhalant Allergens (continued)

Cockroaches

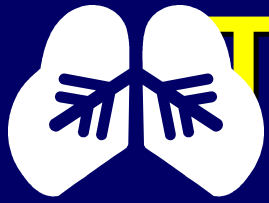
- Use poison bait or traps to control
- Do not leave food or garbage exposed



Teach Patients To Reduce Exposure to Their Inhalant Allergens (continued)

**Pollens (from trees, grass, or weeds)
and
outdoor molds**

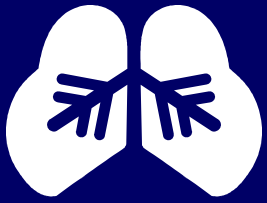
- During their outdoor allergy season(s), adults should stay indoors with windows closed, especially in the afternoon.
- Air conditioning allows windows to remain closed and reduces indoor humidity.



Teach Patients To Reduce Exposure to Their Inhalant Allergens (continued)

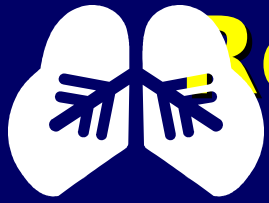
Indoor mold

- Fix all leaks and eliminate water sources associated with mold growth
- Clean moldy surfaces
- Consider reducing indoor humidity to less than 50%



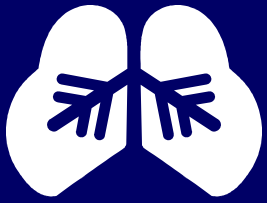
Significant Inhalant Allergens: Additional Considerations

- Air conditioning allows windows to remain closed and reduces indoor humidity.
- Humidifiers and evaporative coolers are not recommended.



Recommendations Regarding Allergen Immunotherapy

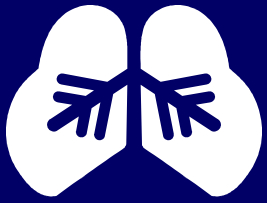
- Consider allergen immunotherapy for asthma patients when:
 - Clear relationship exists between symptoms and unavoidable exposure
 - Symptoms are prolonged or perennial
 - Pharmacotherapy is difficult or expensive because:
 - Medication is ineffective,
 - Multiple medications are required,
 - Patient does not accept medication, or
 - Strong rhinitis component



Work-Aggravated and Occupational Asthma: Evaluation

Recognize the potential for workplace-related symptoms:

- Sensitizers (e.g., isocyanates, plant or animal products)
- Irritants or physical stimuli (e.g., cold/heat, dust, humidity)
- Coworkers have similar symptoms

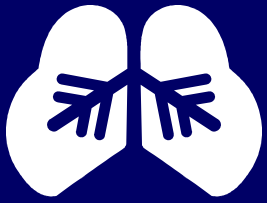


Work-Aggravated and Occupational Asthma:

Evaluation (continued)

Recognize patterns of symptoms in relation to work exposures:

- Improvement during vacations or days off (may take a week or more)
- Symptoms may be immediate (<1 hour), delayed (most commonly, 2 to 8 hours after exposure), or nocturnal
- Initial symptoms may occur after high-level exposure (e.g., spill)

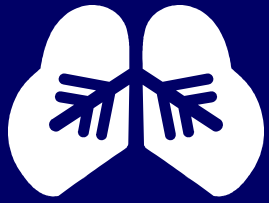


Work-Aggravated and Occupational Asthma:

Evaluation (continued)

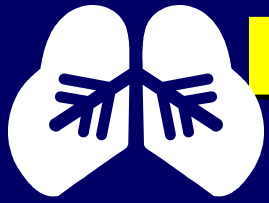
Document work-related airflow limitation

- Serial charting for 2 to 3 weeks (2 weeks at work and up to 1 week off work as needed to identify or exclude work-related changes in peak expiratory flow):
 - Record when symptoms and exposures occur
 - Record when a bronchodilator is used
 - Measure and record peak flow every 2 hours while awake
- Immunologic tests
- Refer for further confirmatory evaluation (e.g., bronchial challenges)



Work-Aggravated and Occupational Asthma: Management

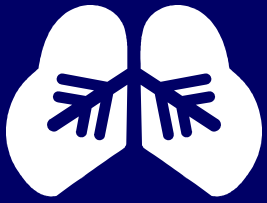
- For work-aggravated asthma, discuss:
 - Avoidance
 - Ventilation
 - Respiration protection
 - Tobacco-free environment
- For occupationally induced asthma, recommend:
 - Complete cessation of exposure to agent



Reduce Irritant Exposure

Tobacco Smoke

- Advise patient and others in home who smoke to stop or to smoke outside
- Discuss ways to reduce exposure from day care, workplace, and other settings

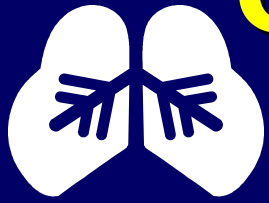


Reduce Irritant Exposure

(continued)

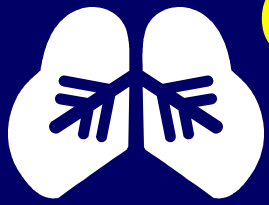
Indoor/Outdoor Pollutants and Irritants

- Discuss ways to reduce exposure to:
 - Wood-burning stoves or fireplaces
 - Unvented stoves or heaters
 - Outdoor pollutants (e.g., avoid outdoor exercise during high-pollution days)
 - Other irritants (e.g., perfumes, cleaning agents, sprays)



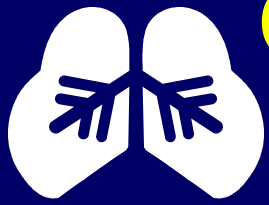
Control Other Factors That Can Influence Asthma Severity

- **Rhinitis**
 - Intranasal corticosteroids are most effective
- **Sinusitis**
 - Promote drainage; antibiotics for complicating acute bacterial infection
- **Gastroesophageal reflux**
 - Medications; no food before bedtime; elevate head of bed
- **Influenza vaccine annually**



Control Other Factors That Can Influence Asthma Severity (continued)

- **Viral infections**
 - Annual influenza vaccination
- **Aspirin/nonsteroidal anti-inflammatory drugs (NSAIDs)**
 - Ask adult patients about sensitivity
 - Counsel avoidance for those with sensitivity, severe asthma, or nasal polyps



Control Other Factors That Can Influence Asthma Severity (continued)

- Sulfite-containing foods/beverages
 - All patients should avoid
- Non-selective (especially) beta-blockers
 - All patients should avoid